

L Number	Hits	Search Text	DB	Time stamp
1	3	5999345.pn.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 08:20
2	1	5999345.pn. and magnification	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 08:40
3	2104	plural adj4 laser	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 08:39
4	2185	plural adj4 (led or (light adj emitting adj (element or point or diode)))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 08:40
5	114	(plural adj4 laser) and magnification	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 08:40
6	77	(plural adj4 (led or (light adj emitting adj (element or point or diode)))) and magnification	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 08:41
7	105	((plural adj4 laser) and magnification) or ((plural adj4 (led or (light adj emitting adj (element or point or diode)))) and magnification)) and (pitch or interval)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 09:09
8	6	("4433911"   "4549084"   "4677301"   "4744662"   "4772119"   "4803524").PN.	USPAT	2002/12/04 09:02
9	59	4908656.URPN.	USPAT	2002/12/04 09:03
10	926	((plural adj4 laser) or (plural adj4 (led or (light adj emitting adj (element or point or diode)))) and (pitch or interval)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 09:10
11	407	(plural adj4 (led or (light adj emitting adj (element or point or diode)))) and (pitch or interval)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 09:10
12	367	((plural adj4 (led or (light adj emitting adj (element or point or diode)))) and (pitch or interval)) not (((plural adj4 laser) and magnification) or ((plural adj4 (led or (light adj emitting adj (element or point or diode)))) and magnification)) and (pitch or interval))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 09:18
13	124272	position adj2 (sensor or detector)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 09:19
14	68	((plural adj4 laser) or (plural adj4 (led or (light adj emitting adj (element or point or diode)))) and (pitch or interval)) and (position adj2 (sensor or detector))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 09:19
15	0	10307271.URPN.	USPAT	2002/12/04 09:30
16	4	("3651258"   "3656175"   "4019186"   "4091390").PN.	USPAT	2002/12/04 09:30
17	33	4253102.URPN.	USPAT	2002/12/04 09:31
18	6	("4053898"   "4253102"   "4276561"   "4393387"   "4566043"   "4591903").PN.	USPAT	2002/12/04 09:35
19	10	4806951.URPN.	USPAT	2002/12/04 09:35
20	1	"4806951".PN.	USPAT	2002/12/04 09:37
21	3	("4806951"   "4892371"   "5786594").PN.	USPAT	2002/12/04 09:37
22	2	("5371608"   "5615038").PN.	USPAT	2002/12/04 09:38
23	5	("4616132"   "4761660"   "4831247"   "4950888"   "5115121").PN.	USPAT	2002/12/04 09:38
24	7	5371608.URPN.	USPAT	2002/12/04 09:39

25	2	5753907.URPN.	USPAT	2002/12/04 09:39
26	8	("4393387"   "5753907"   "5774248"   "5808774"   "5864739"   "5999345"   "6049408"   "6081364").PN.	USPAT	2002/12/04 09:40
27	3	("4547038"   "5610647"   "5850306").PN.	USPAT	2002/12/04 09:40
28	0	6320647.URPN.	USPAT	2002/12/04 09:41
29	10	4806951.URPN.	USPAT	2002/12/04 09:42
30	6	("4053898"   "4253102"   "4276561"   "4393387"   "4566043"   "4591903").PN.	USPAT	2002/12/04 09:43

L Number	Hits	Search	DB	Time stamp
1	456181	led or (light adj emitting)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 06:50
2	83335	magnification	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 06:50
3	842872	interval	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 06:50
4	285635	pitch	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 06:50
5	899	(led or (light adj emitting)) and magnification and interval and pitch	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 06:50
6	134	((led or (light adj emitting)) and magnification and interval and pitch) and sin	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 06:50
7	274	((led or (light adj emitting)) and magnification and interval and pitch) and inclined	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 06:51
8	54	((((led or (light adj emitting)) and magnification and interval and pitch) and sin) and (((led or (light adj emitting)) and magnification and interval and pitch) and inclined)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:04
9	3	((((led or (light adj emitting)) and magnification and interval and pitch) and sin) and beam\$splitter	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:33
10	29	magnification and interval and pitch and ((led or (light adj emitting)) and magnification and interval and pitch) and beam\$splitter	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:07
11	29	magnification and pitch and ((led or (light adj emitting)) and magnification and interval and pitch) and beam\$splitter	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:29
12	29	((led or (light adj emitting)) and magnification and interval and pitch) and beam\$splitter	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:56
13	242	((led or (light adj emitting)) and magnification and interval and pitch) and prism	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:08
14	90	(scanning adj line) and beam\$splitter	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 08:05
15	213	(led or (light adj emitting)) and pitch and beam\$splitter	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:46

16	177	((led or (light adj emitting)) and pitch and beam\$splitter) not ((led or (light adj emitting)) and magnification and interval and pitch) and sin) and beam\$splitter) or (magnification and interval and pitch and ((led or (light adj emitting)) and magnification and interval and pitch) and beam\$splitter) or (magnification and pitch and ((led or (light adj emitting)) and magnification and interval and pitch) and beam\$splitter) or (((led or (light adj emitting)) and magnification and interval and pitch) and beam\$splitter) or ((scanning adj line) and beam\$splitter))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:46
17	100337	position adj (detector or sensor)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:46
18	335	(position adj (detector or sensor)) and beam\$splitter	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:51
19	280	((position adj (detector or sensor)) and beam\$splitter) not ((led or (light adj emitting)) and pitch and beam\$splitter)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:46
20	34	((position adj (detector or sensor)) and beam\$splitter) not ((led or (light adj emitting)) and pitch and beam\$splitter)) and pitch	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:47
21	83	((position adj (detector or sensor)) and beam\$splitter) not ((led or (light adj emitting)) and pitch and beam\$splitter)) and interval	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:48
22	175	((position adj (detector or sensor)) and beam\$splitter) not ((led or (light adj emitting)) and pitch and beam\$splitter)) not (((position adj (detector or sensor)) and beam\$splitter) not ((led or (light adj emitting)) and pitch and beam\$splitter)) and pitch) or (((position adj (detector or sensor)) and beam\$splitter) not ((led or (light adj emitting)) and pitch and beam\$splitter)) and interval))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:48
23	179	(position adj (detector or sensor)) and ((led or (light adj emitting)) and magnification and interval and pitch)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:51
24	179	((position adj (detector or sensor)) and ((led or (light adj emitting)) and magnification and interval and pitch)) not (((position adj (detector or sensor)) and beam\$splitter) not ((led or (light adj emitting)) and pitch and beam\$splitter)) not (((position adj (detector or sensor)) and beam\$splitter) not ((led or (light adj emitting)) and pitch and beam\$splitter)) and pitch) or (((position adj (detector or sensor)) and beam\$splitter) not ((led or (light adj emitting)) and pitch and beam\$splitter)) and interval)))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:54
25	2	5926203.pn.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:55
26	16364	interval and pitch and (sensor or detector)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:58
27	143	(interval and pitch and (sensor or detector)) and beam\$splitter	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:58
28	250	(hai near2 pham).xa.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:58

29	133	((hai n pham).xa.) and (sensor or detector)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 07:58
30	50	((((hai near2 pham).xa.) and (sensor or detector)) and interval	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 08:04
31	8	("4423426"   "5291223"   "5294959"   "5379059"   "5384592"   "5450120"   "5543829"   "5576852").PN.	USPAT	2002/12/04 07:59
32	4	("3999010"   "4000493"   "4059833"   "4253102").PN.	USPAT	2002/12/04 07:59
33	33	4423426.URPN.	USPAT	2002/12/04 08:00
34	8	("4423426"   "5291223"   "5294959"   "5379059"   "5384592"   "5450120"   "5543829"   "5576852").PN.	USPAT	2002/12/04 08:02
35	10	("4423426"   "4933549"   "5043745"   "5202774"   "5504517"   "5576852"   "5635321"   "5677723"   "5883385"   "5986687").PN.	USPAT	2002/12/04 08:02
36	5	("4600837"   "5006705"   "5018808"   "5245181"   "5331147").PN.	USPAT	2002/12/04 08:03
37	2	((("4600837"   "5006705"   "5018808"   "5245181"   "5331147").PN.) and interval	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 08:04
38	0	((("4600837"   "5006705"   "5018808"   "5245181"   "5331147").PN.) and magnification	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 08:04
39	0	((("4600837"   "5006705"   "5018808"   "5245181"   "5331147").PN.) and pitch	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 08:04
40	2	(scanning adj line) and ((("4600837"   "5006705"   "5018808"   "5245181"   "5331147").PN.)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2002/12/04 08:05

**US 4393387 A**

**TITLE:** Beam recording apparatus effecting the recording by a plurality of beams

**Brief Summary Text - BSTX (7):**

If the light beams from a plurality of light sources arranged in a row are deflected by a rotatable polygonal mirror to scan a recording medium, it will be possible to obtain a high speed recording apparatus, but if the beams are arranged in a direction perpendicular to the auxiliary scanning direction of the recording medium, there is a disadvantage that the interval between adjacent beams cannot be narrowed to less than a predetermined distance.

**Brief Summary Text - BSTX (9):**

However, if the recording medium is scanned with the beams being so inclined, the times during which the respective beams cross the recording medium differ and this leads to complicated control of the recording and difficulty with which the recording is effected at an accurate position.

**Brief Summary Text - BSTX (10):**

Also, if information recording is effected by the beams so inclined to in the scanning direction, the scanning pitch in the auxiliary scanning direction of the recording medium by the beams is determined by the arrangement of the plural beams and is thus invariable even if the main scanning speed and the auxiliary scanning speed are varied. Therefore, where a single beam is used, the auxiliary scanning density can be doubled by doubling the main scanning speed, for example, and the recording of high density and high quality can be accomplished by the same apparatus, but where a plurality of beams are used, this cannot be accomplished unless a complicated interlace system is adopted, and it is difficult to effect the recording of high density and high quality by the same apparatus with the scanning pitch in the auxiliary scanning direction being variable.

**Brief Summary Text - BSTX (13):**

It is a further object of the present invention to eliminate various disadvantages occurring when a recording medium is scanned with a plurality of beams inclined relative to the scanning direction so that the arrangement direction of the beams and the scanning direction of the beams are not perpendicular to each other.

**Detailed Description Text - DETX (2):**

The invention will hereinafter be described with respect to an embodiments thereof and with reference to the drawings. In the apparatus shown in FIGS. 1 and 2, reference numeral 1 designates a semiconductor array laser light source having a plurality of light emitting points a, b and c arranged in a row at an interval A. The emissions of beam from the light emitting points a, b and c can be discretely controlled by the image signal from an image signal source 8.

Detailed Description Text - DETX (5):

Thus, if the light emitting points a, b and c of the semiconductor array laser are arranged in the direction 65, the beam after having passed through the image rotator is rotated through 90.degree. into the direction 66. If the direction 66 is set to the scanning direction of the rotatable polygonal mirror, the semiconductor array laser will become arranged perpendicularly to the scanning surface. If the image rotator is rotated through an angle of  $\theta$ , the semiconductor array laser is relatively rotated in the direction 67 and therefore, the beam arrangement after passed through the rotator is rotated in the direction 68 and becomes such as shown in FIG. 3.

Detailed Description Text - DETX (6):

The light source 1 is disposed near the focus of the condensing optical system 2 so that the beams a, b and c have an angle  $\theta$ . ( $\theta = \sin^{-1} P/MA$  where M is the magnification of the entire condensing optical system and imaging optical system) as shown in FIG. 3 which corresponds to a variable pitch P with respect to the rotating surface F of the rotatable polygonal mirror 3, by the image rotator 9 being rotated. Then, the individual light emitting point areas of the semiconductor array laser light source 1 can be regarded as spot light sources because they are as small as 10 and several  $\mu\text{m}$  or less, and there can be provided a plurality of laser lights collimated by the condensing optical system 2.

Detailed Description Text - DETX (8):

**The plurality of laser lights reflected by the rotatable polygonal mirror 3 are imaged and scanned on the photosensitive drum 5 by the imaging lens 4, as shown in FIG. 4. The interval between the light emitting points is A and therefore, if the magnification of the entire opticl system is M, the interval between the imaged spots is MA. Also, the angle of the array of the imaged spots of the array laser with respect to the scanning surface is  $\theta$ . and therefore, the interval between the imaged spots in the direction perpendicular to the scanning is  $MA \sin \theta = P$ .**

Detailed Description Text - DETX (10):

**As described above, the scanning pitch is given by  $P = MA \sin \theta$ . and therefore, the scanning pitch is not varied even if the speed of the main scanning and of the auxiliary scanning is varied. This has led to the difficulty with which high density recording of high quality is effected by doubling the scanning density for the same apparatus.**